Department of LABOR AND INDUSTRIES

ERGONOMICS
Worker Protection

Ergonomics demonstration project: Concrete, rebar and carpentry work

Need

Construction trades represent some of the most hazardous jobs for the development of musculoskeletal injuries in Washington State. General contractors such as Ferguson Construction are responsible for the health and safety of subcontractors, in addition to their own employees. People directly working for the general contractor are often performing work that may have the potential for hazard zone risk factors. This project offered the opportunity to work with the carpentry and concrete work trades, both of which are in the top 12 industry classes for musculoskeletal injuries in the state. The information gained from this project has the potential to help reduce the likelihood of injury for thousands of workers each year.

Goals

The goals of this project are to demonstrate that the employer, working with L&I, can::

- Identify likely hazard zone risk factors for formwork, concrete finishers and re-bar workers and possible solutions for mitigation.
- Test potential mitigation controls for identified hazard zone risk factors.

Project design

A total of 15 site visits were conducted between April and June 2001 at a commercial office building site in Issaquah. Three Labor and Industries ergonomists and consultants recorded work observations at one-minute intervals to obtain ergonomic risk factor level estimates. A total of 826 samples were recorded over the three trades: formwork carpentry, rebar, and concrete finishing. The percentages of observed risk factors were calculated to determine which, if any, Hazard Zone risk factors were present for each trade. These risk factors were discussed with the site foremen to identify all tasks that may present WMSD hazards. Possible solutions for each identified Hazard Zone risk factor were identified and tested for technical feasibility by pilot testing on-site or discussion with workers and foremen. At least one technically feasible control was identifed for each hazard zone risk factor.

Timetable

March 2001.....Begin initial discussions
April 2001.....Initiate hazard analysis and solution research
July 2001 .....Complete draft report on findings
December 2001 .....Final Report

Results

- Lifting was an infrequently observed hazard zone risk factor for carpenters. Hand repetition with force, back bending and lifting were hazard zone risk factors for re-bar workers. No hazard zone risk factors were observed for concrete finishing overall because workers routinely rotated tasks.
- A re-bar tying tool was demonstrated on-site. The tool received favorable reviews from the workers, and appears to reduce hand repetition and back bending hazard zone risk factors for workers who use a tool extension.
- Lifting was addressed through discussion of hazardous tasks and controls at the weekly foreman's meeting. Lifting tables, which described the number of rods capable of being lifted under the rule, were developed. Eliminating one-person heavy lifts and the use of on-site equipment were thought to correct most other heavy lifts.
- A report was completed that identified hazard zone risk factors for formwork, concrete finishing and re-bar work, with solutions tested in the field.